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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,759	03/26/2004	Jiong-Ping Lu	TI 37793	9075
23494 7590 05/17/2007 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EXAMINER LUU, CHUONG A	
			ART UNIT 2818	PAPER NUMBER
			NOTIFICATION DATE 05/17/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com  
uspto@dlemail.itg.ti.com

## Office Action Summary

**Application No.**

10/810,759

**Applicant(s)**

LU ET AL.

**Examiner**

Chuong A. Luu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-10 and 12-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-10 and 12-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-10 and 12-20 have been considered but are moot in view of the new ground(s) of rejection.

## **PRIOR ART REJECTIONS**

### **Statutory Basis**

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### **The Rejections**

Claims 1, 3, 4-5, 7-8, 10, 12-14 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Armacost et al. (U.S. 5,545,581).

Armacost discloses a semiconductor device with

(1) forming a polysilicon gate electrode over a substrate (14) (see Figure 3);

forming source/drain regions (28) in said substrate (14) proximate said polysilicon gate electrode (see Figure 3);

forming a blocking layer (34) over said source/drain regions (28) in a step, said blocking layer (34) comprising a metal silicide (34) (see Figure 3);

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siliciding said polysilicon gate electrode to form a silicided gate electrode in a later step, said blocking layer protecting said source/drain regions (28) from said siliciding (see Figure 3);

(3); (12) wherein said blocking layer is a silicided source/drain contact region (see Figure 3);

(4); (13) wherein said silicided gate electrode comprises a different metal silicide than said blocking layer (see Figure 3);

(5); (14) wherein said blocking layer comprises a cobalt silicide and said silicided gate electrode comprises a nickel silicide (see Figure 3);

(7); (16) further including forming a protective layer (22) over said polysilicon gate electrode prior to said forming a blocking layer over said source/drain regions (28) (see Figures 1-3);

(8); (17) wherein said protective layer is a silicon nitride protective layer (see Figures 1-3);

(10) forming a polysilicon gate electrode over a substrate (14) (see Figures 1-3);  
forming source/drain regions (28) in said substrate (14) proximate said polysilicon gate electrode (see Figures 1-3);

forming a blocking layer (34) over said source/drain regions (28) in a step, said blocking layer comprising a metal silicide (see Figures 1-3);

siliciding said polysilicon gate electrode to form a silicided gate electrode (see Figures 1-3);

forming interconnects within dielectric layers (38) located over said substrate (14) for electrically contacting said semiconductor devices (see Figure 7).

## **PRIOR ART REJECTIONS**

### **Statutory Basis**

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **The Rejections**

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armacost et al. (U.S. 5,545,581) in view of Erhardt et al. (U.S. 6,514,859 B1).

Armacost teaches the above outlined features except for herein siliciding said polysilicon gate electrode to form a silicided gate electrode includes fully siliciding said polysilicon gate electrode to form a fully silicided gate electrode. However, Erhardt discloses a semiconductor device with (9); (18) wherein siliciding said polysilicon gate electrode to form a silicided gate electrode includes fully siliciding said polysilicon gate electrode to form a fully silicided gate electrode (see column 5, lines 36-49. Figure 9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the MOS transistors of Armacost (accordance with

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the teaching of Erhardt). Doing so would facilitate the manufacture of the semiconductor MOS transistor and improve the speed of the semiconductor device.

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armacost et al. (U.S. 5,545,581) in view of Wieczorek et al. (U.S. 6,423,634 B1).

Armacost teaches everything above except for having the specific thickness of the blocking layer ranging from about 10 nm to about 35 nm. However, Wieczorek discloses a semiconductor device **(6); (15)** wherein said blocking layer has a thickness ranging from about 15nm to about 75nm (10 nm to about 35 nm) (see column 5, lines 3-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the MOS transistors of Armacost (accordance with the teaching of Wieczorek) and it also has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in the ranges claimed. In re Aller, 105 USPQ 233 (see MPEP j 2144.05).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Chuong Anh Luu  
Patent Examiner  
May 08, 2007